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ABSTRACT

Courses using a Personalized System of Instruction (PSI) have proliferated in the past decade. Researchers have explored various factors related to PSI, but rarely, if ever, have students' study habits or preferences been considered. A questionnaire examining the study habits, exam preferences and attitudes toward various instructional formats was administered to 762 introductory psychology students enrolled in either lecture/seminar or PSI sections. Analyses comparing methods revealed different behavioral patterns for students who performed well under PSI and lecture/seminar formats. Successful PSI students were orderly, systematic hard workers who emphasized the printed word; they believed that the PSI method would produce higher grades. Successful lecture/seminar students focused their studying to the time prior to performance events, required aid in organizing course material and were as concerned with the spoken as with the written word. Science students gravitated toward PSI while Arts/Humanities students prefered lecture/seminar courses. The findings suggest that PSI is personalized for some, but not all, students. (The survey instrument is included in the appendix.) (Author/NRB)

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PSI, Personalized for Whom?

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During the past ten years courses using PSI have rapidly proliferated. Along with this, there has been a corresponding increase in publications lauding its success or examining its mechanics (Kulik, 1979). These studies have generally focused on the success of the method, variations in course mechanics or the rule of theoretical principles in the course (Sherman, 1974; Badia, Harsh & Stutts, 1978; Kulik, 1979). With respect to students, it is their personality profiles, degree program or past academic performance which are of most interest to investigators (Born & Whelan, 1973; Calhoun, 1975). Rarely if ever are students' study habits or preferences considered. In fact, some have even suggested that student's study habits in a self paced course are not unlike those practiced by students in traditional courses (Wesp, 1979). This latter should be examined in the light of the belief of many educationalists that learning and motivation for learning are ultimately internal to the learner (Ainsworth, 1978).

To investigate this, we administered a questionnaire to seven hundred and sixty-two students who, over a two-year period, participated in a PSI or lecture/seminar section of an introductory psychology course. It was designed to quiz them on their study habits, course organization abilities, and course format preferences (i.e., system of delivery, type of examination and scope of examination). Each student completed the questionnaire during the final week of the course along with the general course/teacher evaluation form given at this University. (Table 1).

Descriptive statistical analysis of response served to identify answers common to students under each method. These patterns of model response on questions identified as significant by chi-square analysis provide an interesting description of students both in the PSI and L/S sections.

Overall, PSI students report spending more time studying than they would in a traditional lecture course. The amount of time spent per week was greater than three hours. Students prepared for the modules either by the prescribed method or by intensive studying prior to taking the module test. However, in preparing for midterm examinations (for which no detailed guidance was given) students increased their rate of studying as the exam approached. In any case, students expected to get higher grades by using the PSI system rather than by the L/S method. They also highly favoured applying the method to other courses. These students also expressed preference for written presentations of course material within a framework which allowed students some freedom of organization. In fact, most students reported that they generally had little trouble organizing material. Given the choice, students preferred examinations covering all course material using multiple choice questions. In summary, students in a PSI course work HARD in an orderly manner covering written facts.

L/S students studied less than three hours per week which was similar to the amount of time and effort spent in their other courses. They reported that most of their studying occurred just prior to examinations or seminars. They expected to receive a grade that didn't differ from their normal range and were indifferent about the L/S method in general. Preference

was expressed for formally organized courses. In fact, they tended to use the organization given in the text as that for the course as a whole. Given the choice L/S students prefer to be examined by multiple choice questions over the entire content of the course. In summary L/S students study hard just before performance events overall.

We then subjected the questionnaire data to comparative analysis between the two methods. Analysis of variance and discriminant analysis over all the data produced similar patterns of differentiation between the methods. (Table 3). From the analysis the following comparative conclusions were drawn:

1. PSI students believed the method would produce a high grade while L/S students were neutral concerning the relationship of method and grade.

2. Overall, PSI students studied longer than usual using systematic techniques. L/S students studied normally by focusing their studying prior to performance events.

3. PSI students reported that they need little help in organizing a course. L/S students reported that they needed some help and usually used the most formal (e.g. text) means available.

4. PSI students tended to favor written material oriented while L/S students oriented to both text and lecture material.

Both final grades and this survey might seem to suggest that PSI is the best method for teaching introductory psychology. But the standard teaching evaluation given to all students at this university fails to identify any preference for the method when compared to the preferences expressed in L/S sections despite the differential performance levels. (Leppmann & Herrmann, 1981). In fact, during the initial week of the

semester (the drop/add period) an equal number of students transferred between sections, giving the method as their reason. (McIntosh, 1980)

In addition some PSI students do poorly on the portions of the final exam given to all introductory students while many L/S students do as well or better than PSI students. The probability of success or failure is only partially accounted for by general academic achievement. In fact, academic achievement attains higher correlations with L/S scudents performance than with PSI students (McIntosh, 1980). It may be, therefore, that PSI is not a penacea but simply serves to strengthen those skills and preferences already found in many but not all students. This speculation is based on the findings that a) PSI improves the grades of all students, but more so for some than others (Roberts et al., 1980); b) many students drop PSI courses because they are too much work (Semb et al., 1979) and c) many students do well in a PSI course but are dissatisfied with the method (McIntosh, 1980).

In order to examine the habits and preferences of students who do well or poorly under each method we performed a split of the data selecting only those students who fell one (1) standard deviation above or below the mean based on final examination performance. Response patterns were then tested using both analysis of variance and discriminant analysis and revealed the following patterns of significant differences.

High Scoring (HIGH) vs. Low Scoring (LOW) PSI students display the following differences:

1. HIGH students prepare systematically before taking module tests. LOW scoring students study intensely just before taking the same tests.

2. HIGH students believe the method requires the same time and

effort expenditure as the L/S method. LOW students believe PSI requires more time and effort than L/S courses.

3. HIGH students believe PSI will produce a high grade while LOWs are not so convinced.

4. HIGH students are capable of self-organizing course material while LOW students need some help.

5. HIGH students tend to be students in upper semesters while LOW students take the course earlier in their university careers.

In the L/S sections HIGH vs. LOW students differ:

1. HIGH students study in an intense but organized manner while LOW students are less than organized in their study habits.

2. HIGH students are lecture rather than text oriented while LOW students are test material oriented.

Before any overall conclusions were drawn from these comparisons we continued our analysis but not comparing HIGH and LOW students from each method. Table 4 presents the patterns resulting from Discriminant and Analysis of Variance techniques which again were very similar.

HIGH Scoring students:

1. PSI students believe the method will produce a high grade while L/S students are neutral on the method/grade relationship.

2. PSI students perceive the method as requiring greater effort than the L/S method. L/S students do not make the same perception but believe each requires equal effort.

3. PSI students study long and in a systematic manner. L/S students study only slightly less but usually just before performance events.

4. PSI students oriented toward the written material while L/S students are more interested in both the written and spoken word.

5. PSI students are enrolled in Science majors and report they need little help in organizing course material. L/S students are Arts/Humanities majors who need direction in organizing course material.

LOW scoring students:

1. PSI students believe the method requires a lot of time and effort. They study longer than usual, expect a higher grade and would like more courses using this method. L/S students study normally. They did not prefer this method nor did they express a grade expectency related to it.

2. PSI students tend to be written word oriented males while L/S students are females who prefer the spoken word.

These analyses clearly differentiate several university populations, only some of which are PSI oriented. PSI fills the needs of those students who are orderly, systematic and oriented toward the written word. Above all, they are hard workers who believe in the method. It may also be valuable to those students who believe in the method and who can adjust their habits to get better grades. There remains, however, a large segment of the student population for which L/S courses are the way to success. They focus their study before those events which require them to display their knowledge, need aid in organizing courses and are concerned with the spoken as well as written word. Students interested in the science gravitate toward PSI while Arts/Humanities students lean toward L/S.

PSI is personalized for some but not all students.

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TABLE 1

INTRODUCTORY PSYCHOLOGY

FORMAT EVALUATION QUESTIONNAIRE

Note: None of the information given on this questionnaire will affect your grade in this course. In fact, the questionnaire is confidential and will not be processed until after grading for the course has been completed.

1. Compared to other courses at this level, this course demanded _____ time and effort.

   1. less
   2. as much
   3. more

2. The average time I spent studying for this course each week was:

   1. less than 1 hour
   2. less than 2 hours
   3. less than 3 hours
   4. more than 3 hours

3. I find that the (PSI on Lecture/Seminar)* method used in this course

   1. requires less effort than courses which use the (PSI or Lecture/Seminar)* method
   2. requires as much effort as courses which use the (PSI or Lecture/Seminar)* method
   3. requires more effort than courses which use the (PSI or Lecture/Seminar)* method

4. The use of this method in this course will probably result in my:

   1. getting a lower grade
   2. getting the same grade
   3. getting a higher grade

5. If you had your choice would you like to see this method applied to your other courses?

   1. no
   2. makes no difference
   3. yes

6. When studying for a course

   1. I have little trouble organizing the material
   2. I need some help organizing the material
   3. I use the organization provided by the textbook
   4. I need a lot of help in organizing the material

7. I prefer courses which:

   1. have a formal and consistent organization of the material
   2. present a framework within which the student can organize the material
   3. leave the students to organize the material as they wish
   4. are totally informal with both content and structure evolving from the course itself

8. In general I prefer courses which:

   1. use a text(s) which contains all information for the course
   2. use of text(s) for the major portion of the required information
   3. use reference materials which give access to the information required by the course but presented in lecture
   4. use no texts with the professor providing all information

9. I prefer courses which:

   1. examine only on textual material
   2. examine on both textual and lecture material
   3. examine only on lecture material
   4. do not have examinations but require term papers or projects

10. I prefer

   1. multiple choice examinations
   2. fill in the blanks or other short answer questions
   3. essay type examinations
   4. oral format examinations

11. How do you normally prepare for examinations?:

   1. Not at all
   2. In no particular manner
   3. Concentrated cram sessions as close to the exams as possible
   4. Increased studying as the exam approaches
   5. Systematically organizing the course on a week to week basis

12. How did you prepare for (Modules/Seminars)*?:

   1. Did not prepare at all
   2. By reviewing the summary material available
   3. By intensive studying before the event
   4. Systematically over the week

13. How did you prepare for the midterm examinations?

   1. Not at all
   2. By reviewing the chapter summaries and glancing at my notes
   3. By intensively studying before the exam
   4. By increased studying as the exam approached
   5. Systematically on a week to week basis

14. My degree program is

    1. B.A.
    2. B.Sc.
    3. Other

15. I am now completing my

    1. first semester
    2. second semester
    3. third semester
    4. fourth semester
    5. fifth semester
    6. sixth semester

16. I am

    1. male
    2. female

* As appropriate

TABLE 2

QUESTIONNAIRE RESPONSE PATTERNS*

Question	Model Responses	
	PSI	L/S
1. Time and effort required compared to other courses at this level	More	As much
2. Time spent studying each week	>3 hours	<3 hours
3. Amount of effort required compared to other method	More	Same
4. Method will result in a grade which is	Higher	Same
5. Apply to other courses	Yes	No/no difference
6. Do you have trouble organizing course material	Little	Need help
7. Prefer course organized by	Framework	Formal
8. Information source preferred	Text	Text for most
9. Exam material preference	Text	Text and lecture
10. Exam type preference	Multiple choice	Multiple choice
11. Normally prepare for exams by	Increase as exam approaches	Increase as exam approaches
12. Prepared by modules/seminars	Cram/systematic	Cram
13. Prepared for midterm examinations	Increase as exam approaches	Cram, increase as exam approaches
14. Degree program	B.Sc.	B.A.
15. Semester level	2nd	2nd
16. Sex	Female/Male	Male/Female

TABLE 3

COMPARISON OF PSI VERSUS LECTURE/SEMINAR STUDENTS

Question		Discriminant Coefficient	F(p)	Hours	
				PSI (N=Y22)	L/S (N=360)
4	RESULT IN GRADE	.57	76.23 (0001)	2.54	1.99
12	PREPARE MODS/SEMINAR	.48	33.53 (0001)	3.43	2.91
2	AVERAGE HOURS STUDIED PER WEEK	.47	54.69 (0001)	3.34	2.82
1	TIME & EFFORT REQUIRED COMPARED TO OTHER METHOD	.34	33.32 (0001)	2.34	1.75
13	PREPARE FOR MIDTERM EXAMS	.29	12.61 (0005)	3.62	3.32
3	EFFORT REQUIRED COMPARED TO OTHER COURSES AT THIS LEVEL	.26	20.03 (0001)	2.24	1.91
6	WHAT HELP DO YOU NEED TO ORGANIZE COURSE	-.22	5.39 (03)	1.95	2.47
10	EXAM MATERIAL PREFERENCE	-.19	10.17 (002)	2.45	2.74
14	ACADEMIC PROGRAM	.17	6.63 (01)	2.56	2.26
16	GENDER	.08	4.29 (04)	1.79	1.66

TABLE 4

COMPARISONS OF HIGH AND LOW SCORING STUDENTS ON FINAL EXAM

Question		Discriminant Coefficient	F(P)	$\bar{X}$	
				High	Low
		(PSI)		(N=170)	(N=132)
12	PREPARE FOR MODULES	.61	29.44 (.0001)	3.84	3.34
1	TIME & EFFORT REQUIRED COMPARED TO L/S METHOD	-.44	19.24 (.0005)	2.00	2.44
4	RESULT IN GRADE	.37	10.61 (.001)	2.65	2.24
6	WHAT HELP DO YOU NEED TO ORGANIZE COURSE	-.34	10.68 (.001)	1.74	2.20
9	EXAM MATERIAL PREFERENCE	-.31	6.57 (.02)	2.23	2.67
15	SEMESTER	.30	10.69 (.001)	1.63	1.41
2	AVERAGE HOURS STUDIED PER WEEK	.18	3.97 (.05)	3.34	3.13
		(LECTURE)		(N=154)	(N=127)
2	AVERAGE HOURS STUDIED PER WEEK	.48	3.92 (.05)	2.92	2.59
12	PREPARE SEMINARS	.48	5.93 (.01)	3.37	2.45
8	COURSE INFORMATION MEDIUM PREFERRED	.43	14.13 (.005)	2.83	1.48
3	EFFORT REQUIRED COMPARED TO OTHER COURSES AT THIS LEVEL	-.42	0.81 (.36)	1.87	2.00

TABLE 5

COMPARISON OF SUCCESS LEVEL BY METHOD

Question		Discriminant Coefficient	F(P)	$\bar{X}$ PSI	$\bar{X}$ L/S
		(HIGH SCORING)		(N=190)	(N=154)
4	RESULT IN GRADE	.65	44.23 (.0001)	2.64	1.92
3	EFFORT REQUIRED COMPARED TO OTHER METHOD	.39	5.23 (.03)	2.16	1.87
13	PREPARE FOR MIDTERM EXAMINATIONS	-.38	9.45 (.002)	3.86	3.36
2	AVERAGE HOURS PER WEEK STUDIED	.27	11.66 (.0008)	3.34	2.93
14	PROGRAM	.24	3.94 (.05)	2.64	2.22
6	WHAT HELP DO YOU NEED IN ORGANIZING COURSE	-.23	3.46 (.06)	1.72	2.01
12	PREPARE FOR MODULES/SEMINARS	.21	6.81 (.009)	3.84	3.37
8	PREFER COURSE WITH EXAM INFORMATION	.22	4.39 (.04)	2.33	2.64
9	EXAM MATERIAL PREFERRED	-.13	.48 (.58)	1.74	1.84
		(LOW SCORING)		(N=132)	(N=127)
2	AVERAGE HOURS PER WEEK STUDIED	.46	12.63 (.0005)	3.13	2.59
1	TIME & EFFORT REQUIRED COMPARED TO OTHER METHOD	.44	17.93 (.0001)	2.44	1.84
3	EFFORT REQUIRED COMPARED TO OTHER COURSES AT THIS LEVEL	.40	12.70 (.0005)	2.50	2.00
4	RESULT IN HIGHER GRADE	.26	3.63 (.06)	2.24	1.95
14	DEGREE PROGRAM	.22	1.23 (.26)	2.35	2.13
5	WOULD LIKE THIS METHOD IN OTHER COURSES		3.20 (.08)	2.13	1.83
16	GENDER	.16	3.59 (.06)	1.41	1.59
8	COURSE MATERIAL INFORMATION MEDIUM PREFERRED	.08	4.63 (.03)	1.85	1.48